Project for guaranteeing the safety of foods prepared by small local producers.

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Introduction

The Veneto Region, through Regional legislation (law DGR 2016/2007), has authorised the sale of small quantities of processed foods (both animal- and non-animal-based) from "small local producers" directly to the consumer and has defined the hygienic requirements for the production and sale of these foods. The objective of the present analysis was to test for the presence of pathogens in samples of cured meats from small local producers and in faeces samples from the animals used to produce these foods, so as to determine whether or not the Regional legislation allows the objectives of the European legislation on food safety (Regulation 178/02 and 852/04) to be met.

Materials and Methods

The following samples were collected from small local producers in the Veneto Region:

- Faeces samples and mesenteric lymph nodes from the domestic pigs used to produce the cured meats tested in this study, collected during slaughtering (30 samples)
- Samples of the fresh meat mixture used to produce the cured meats tested in this study (17 samples). The samples were collected on the same day that the meat mixture was prepared and from the same animals from which the faeces samples and lymph nodes were collected.
- Samples of cured meats (salami of different sizes, from 800-1000 g to 3000-4000 g) made from the fresh meat mixture (39 samples). The meats had been cured for at least 70-80 days up to 3-4 months, the duration of curing depends on the size of the product.

The faeces samples were analysed for:

- *Campylobacter spp* and
- *Escherichia coli* O157.

The lymph nodes were analysed for:

- *Salmonella* spp.

The meat products were analysed for:

- *Salmonella* spp. (ISO 6579:2002/Cor 1:2004E)
- *Listeria monocytogenes* (ISO 11290-1:1996/Amd 1 2004 and ISO 11290-2:1998/Amd 1 2004)
- Sulphate-reducing Clostridia (in-house method)
- *Campylobacter spp.* (in-house method)
- *Escherichia coli* O157 (real time PCR, in-house method)
- pH and water activity

All of the samples were analysed at the laboratories of San Donà di Piave and the Salmonellosis Reference Centre of the Istituto Zooprofilattico Sperimentale delle Venezie.

Results

The results of the analyses of the samples of faeces and lymph nodes are shown in Table 1. All of the lymph node samples were negative for *Salmonella spp.* Two of the 30 faeces samples (6.7%) were

positive for *Escherichia coli* O157; the EAE gene was present in both samples, yet the strains were not verocytotoxin-producing (i.e., they were negative for the genes VT-1 and VT-2).

Table 1 – Results of bacteriological analyses of faeces and lymph node samples

	Positive/Total	
	Faeces	Lymph nodes
Salmonella spp	-	0/30
Campylobacter spp	0/30	-
Escherichia coli O157	2/30	-
EAE gene	2/2	-
VT-1 and VT-2	0/2	-

The results of the analyses of fresh and seasoned sausages and salami are shown in Table 2. The analysis did not reveal *Salmonella spp* or *Campylobacter spp*. Four samples (10.3%) were positive for *E. coli* O157, yet the genes VT-1 and VT-2 were not detected. One sample was positive for the gene EAE.
Four samples (10.3%) were positive for *Listeria monocytogenes*, and three samples (7.7%) were positive for non-monocytogenes Listeria (one case each of *Listeria innocua*, *Listeria ivanovii* and *Listeria spp.*)
Seven samples (17.9%) were positive for sulphate-reducing Clostridia, yet *Clostridium perfringens* was not found in any of these samples.

Table 2 – Results of microbiological analyses of fresh and seasoned sausage and salami

	Positive/Total		
	Fresh mixture	Small salami (800-1000 g)	Large salami (3000 – 4000 g)
Salmonella spp	0/17	0/20	0/19
Campylobacter spp	0/17	0/20	0/19
Sulphate-reducing Clostridia	3/17	3/20	1/19
Escherichia coli O157	2/17	1/20	1/19
Listeria monocytogenes	0/17	2/20	2/19
Non-monocytogenes Listeria	0/17	2/20	1/19

The values obtained for pH and water activity, which are important for establishing whether or not the product represents suitable terrain for *Listeria monocytogenes*, are shown in Table 3.

Table 3 – pH and water activity in fresh and seasoned salami and sausage

	pH and water activity (a_w)					
	Fresh mixture		Small salami (800-1000 g)		Large salami (3000 – 4000 g)	
	Min	Max	Min	Max	Min	Max
pH	5.6	6.2	5.3	6.5	5.5	5.95
a_w	0.91	0.98	0.83	0.92	0.88	0.94

Discussion

The results of these analyses show that only a small proportion of samples were positive for potentially zoonotic microorganisms. Although *Escherichia coli* O157 was detected in faeces and food samples, this should not be cause for alarm, in that none of the isolated strains was verocytotoxin-producing. Sulphate-reducing Clostridia were found at very low concentrations (10-20 ufc/g), except in one sample (2,100 ufc/g), yet *Clostridium perfringens* was not detected. The presence of *Listeria monocytogenes*, which was found in some cured products, is probably related to cross contamination, a low salt content, or inadequate seasoning. Levels of pH and water activity that are conducive to the growth of *Listeria monocytogenes* were only found for the fresh meat mixture, whereas these levels were sufficiently low in the cured products. In only three samples was the water activity higher than 0.92.

Conclusions

This study, though in its initial phase, revealed that the risk associated with the consumption of pork products prepared by small local producers is low. Additional analyses will be performed next autumn-winter to confirm these results and to evaluate the risk associated with the consumption of meat products prepared by these producers. The transformation of animal products according to the criteria for small local producers may represent a challenge, in that these producers must reconcile traditional recipes and methods and current hygienic standards for production and storage.

References

Commission Regulation (EC) No 2073/2005 of 15 November 2005 on microbiological criteria for foodstuffs

Delibera della Giunta Regionale del Veneto n. 2016 del 3 luglio 2007 sull'applicazione Regolamenti CE nn. 852, 853, 854 e 882/2004, e successive modifiche e integrazioni, per piccole realtà produttive.

D.M. 20 novembre 2007 "Attuazione dell'art. 1, comma 1065, della legge 26 dicembre 2006, n. 296, sui mercati riservati all'esercizio della vendita diretta da parte degli imprenditori agricoli"

Delibera della Giunta Regionale del Veneto n. 1892 del 8 luglio 2008 lavorazione, preparazione e vendita di carni avicunicole fresche e suine trasformate presso i produttori primari:protocollo sperimentale